

Considered
1/18/03
mcr

Barb O'Bryen

Access DB#

79290

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: My-Chau Tran Examiner #: 18933 Date: 11/4/02

Art Unit: 1639 Phone Number 305-6999 Serial Number: 09/848,727

Mail Box/land Bldg/Room Location: CMI, 8A16 Results Format Preferred (circle): PAPER DISK E-MAIL
LD 38071

If more than one search is submitted, please prioritize searches in order of need.

mej

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc., if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Biological Identification System with Integrated Sensor

Inventors (please provide full names): Vincent Jen-JR., Gau Chia.

Earliest Priority Filing Date: 5/3/00

For Sequence Searches Only Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

Mrs. O'Bryen

Please perform the following:

- 1) Inventor Search
- 2) Search Claims 34-37 and 41 which are attached.

Thanks

Point of Contact:
Barb O'Bryen
Technical Information Specialist
STIC CM1 6A05 308-4291

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=> d que 138

L38 1 SEA GAU V?/AU ↵

=> fil wpids; d que 114

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FILE LAST UPDATED: 5 NOV 2002 <20021105/UP>
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L14 1 SEA FILE=WPIDS ABB=ON GAU V?/AU ↵

=> fil cap1; d que 115

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inventor
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FILE COVERS 1907 - 7 Nov 2002 VOL 137 ISS 19
FILE LAST UPDATED: 6 Nov 2002 (20021106/ED)

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L15 0 SEA FILE=CAPLUS ABB=ON GAU V?/AU *

=> fil biosis; d que 127

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CAS REGISTRY NUMBERS AND CHEMICAL NAMES (CNS) PRESENT
FROM JANUARY 1969 TO DATE.

RECORDS LAST ADDED: 30 October 2002 (20021030/ED)

L27 1 SEA FILE=BIOSIS ABB=ON GAU V?/AU *

=> dup rem 127,114,138 *

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PROCESSING COMPLETED FOR L27
PROCESSING COMPLETED FOR L14
PROCESSING COMPLETED FOR L38

L58 2 DUP REM L27 L14 L38 (1 DUPLICATE REMOVED)
ANSWER '1' FROM FILE BIOSIS
ANSWER '2' FROM FILE WPIDS

=> d ibib ab 158 1-2 *

L58 ANSWER 1 OF 2 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.DUPLICATE 1

ACCESSION NUMBER: 2001:259246 BIOSIS
 DOCUMENT NUMBER: PREV200100259246
 TITLE: MEMS DNA sensors to detect endothelial MCP-1 expression under pulsating flow.
 AUTHOR(S): Hsiai, Tzung K. (1); Huang, Tony; Gau, Vincent;
 Reddy, Srinuvasa (1); Ho, Chih Ming
 CORPORATE SOURCE: (1) Division of Cardiology, UCLA Medical Center, UCLA School of Medicine, 10833 Le Conte, Los Angeles, CA, 90095-9075 USA
 SOURCE: FASEB Journal, (March 7, 2001) Vol. 15, No. 4, pp. A485. print.
 Meeting Info.: Annual Meeting of the Federation of American Societies for Experimental Biology on Experimental Biology 2001 Orlando, Florida, USA March 31-April 04, 2001
 ISSN: 0892-6638.

DOCUMENT TYPE: Conference
 LANGUAGE: English

SUMMARY LANGUAGE: English

AB Background. MEMS (Micro Electro-Mechanical Systems) DNA sensor is an emerging tool based on microfabrication and semiconductor technology. Ox-PAPC, a component of oxidized lipid, upregulates endothelial MCP-1 expression. MEMS sensors were used to detect whether pulsatile flow patterns could modulate MCP-1 expression in ox-PAPC treated endothelial cells. Methods and Results. We examined the upstroke slopes of arterial pulsatile flow, or shear stress slew rates defined as $\Delta t_{tau}/\Delta t$, on MCP-1 and GAPDH mRNA expression. Three flow conditions were delivered to ox-PAPC treated bovine aortic endothelial cells (BAEC) at 60 BPM: (1) high $\Delta t_{tau}/\Delta t$ ($= 293 \text{ dyne/cm}^2/\text{sec}$) at time-averaged shear stress (τ_{ave}) $= 50 \text{ dynes/cm}^2$, (2) low $\Delta t_{tau}/\Delta t$ ($= 71 \text{ dyne/cm}^2/\text{sec}$) at $\tau_{ave} = 50 \text{ dynes/cm}^2$, and (3) oscillating flow ($\pm 26 \text{ mmHg}$) at $\tau_{ave} = 0 \text{ dyens/cm}^2$. Pulsatile flow at both high and low $\Delta t_{tau}/\Delta t$'s attenuated the MCP-1 mRNA current output compared to no flow conditions (high $\Delta t_{tau}/\Delta t$: $0.24 \mu\text{Amp} \pm 0.02$; low $\Delta t_{tau}/\Delta t$: $0.26 \mu\text{Amp} \pm 0.04$; ox-PAPC: $0.30 \mu\text{Amp} \pm 0.02$; $p < 0.005$). In contrast, oscillating flow increased MCP-1 mRNA current by $56.7\% \pm 3.7\%$ ($0.47 \mu\text{Amp} \pm 0.03$, $p < 0.005$). The current output for GAPDH mRNA was similar for all conditions ($0.21-23 \mu\text{Amp}$, $p > 0.05$). The differential MCP-1 current output and GAPDH as the control were validated by RT-PCR. Conclusions. Unidirectional pulsatile flow downregulated MCP-1 mRNA expression in oxidized lipid stimulated BAEC, whereas reversing oscillating flow, which is associated with vascular sites prone to atherosclerosis, upregulated MCP-1 expression. For the first time, we detected the differential MCP-1 current output by MEMS DNA sensors without RT-PCR. This finding implicates the importance of $\Delta t_{tau}/\Delta t$ in modulating MCP-1 expression for monocyte binding to endothelial cells.

L58 ANSWER 2 OF 2 WPIDS (C) 2002 THOMSON DERWENT
 ACCESSION NUMBER: 2002-114149 [15] WPIDS
 DOC. NO. NON-CPI: N2002-085149
 DOC. NO. CPI: C2002-034956
 TITLE: Microfabricated electrochemical biosensor, useful for detecting ions, proteins and nucleic acid, produced by integrated circuit technology.
 DERWENT CLASS: B04 D16 J04 L03 S03 S05 U12
 INVENTOR(S): GAU, V J; GAU, J
 PATENT ASSIGNEE(S): (GAUJ-I) GAU J; (GAUV-I) GAU V J
 COUNTRY COUNT: 95
 PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG
WO 2001083674	A1	20011108	(200215)*	EN	84
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ					
NL OA PT SD SE SL SZ TR TZ UG ZW					

W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK
 DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ
 LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD
 SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
 AU 2001061145 A 20011112 (200222)
 US 2002123048 A1 20020905 (200260)

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
WO 2001083674	A1	WO 2001-US14257	20010502
AU 2001061145	A	AU 2001-61145	20010502
US 2002123048	A1 Provisional	US 2000-201603P	20000503
		US 2001-848727	20010503

FILING DETAILS:

PATENT NO	KIND	PATENT NO
AU 2001061145	A Based on	WO 200183674

PRIORITY APPLN. INFO: US 2000-201603P 20000503; US 2001-848727
 20010503

AB WO 200183674 A UPAB: 20020306

NOVELTY - Detecting or quantifying an analyte (I) by applying a sample to the electrodes of a microfabricated electrochemical biosensor and measuring an electrical signal, is new. The biosensor comprises a substrate having fabricated on it, by integrated circuit (IC) technology, at least two electrodes that consist of a single layer of conductive material.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(1) microfabricated electrochemical biosensor comprising a silicon substrate and three redox-sensing electrodes, each a single layer of gold formed by IC technology;

(2) detecting (I) by applying a sample to a biosensor having two surface areas with different properties, one for immobilizing (I) and the other for:

(a) confining the sample by surface tension forces between the two areas; and

(b) for detecting (I); and

(3) device for detecting a redox event of at least one (I).

USE - For detecting/determining ions (metals) or macromolecules (DNA, RNA or proteins), e.g. in rapid detection of pathogenic bacteria.

ADVANTAGE - The sensor may incorporate hybridization and enzymatic amplification for increased sensitivity and miniaturization. Sample and reagent can be confined by surface tension forces, making it possible to incorporate the sensor in portable/hand-held instruments and protecting them against shaking or inversion. The entire sensor system can be prepared on a single chip, eliminating the need for external components. The sensors are easy to produce, inexpensive and reusable, with the same robustness and reversible electrochemical performance as conventional sensors. By confining sample and detection reagent to specific regions of the substrate, problems of non-specific binding are overcome (improving sensitivity), only very small samples are required (ensuring transport by diffusion, without the need for any mixing), coverage of the electrodes is easily controlled and loss of target analyte is minimized.

Dwg.0/35

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=> d que 153; d que 157; s (153 or 157) not 138

L39 98650 SEA REDOX OR (OXIDATION(A) REDUCTION)
L41 1441498 SEA SEMICONDUCTOR# OR INTEGRATED(A) CIRCUIT#
L42 3057 SEA SEMI CONDUCTOR#
L43 18605 SEA MICROELECTROMECHANICAL OR (MICRO ELECTRO OR MICROELECTRO) (W
) MECHANICAL OR MICRO ELECTROMECHANICAL OR MEMS
L44 448715 SEA ELECTRODE#
L45 3103 SEA DETECTION(2A) CIRCUIT?
L46 4298 SEA BIAS(2A) (CONTROL# OR POTENTIAL#)
L48 1319 SEA L39 AND (L41 OR L42 OR L43) AND L44
L53 ...10 SEA L48 AND (L45 OR L46) *

L39 98650 SEA REDOX OR (OXIDATION(A) REDUCTION)
L40 570054 SEA BIOSENSOR# OR SENSOR#
L41 1441498 SEA SEMICONDUCTOR# OR INTEGRATED(A) CIRCUIT#
L42 3057 SEA SEMI CONDUCTOR#
L43 18605 SEA MICROELECTROMECHANICAL OR (MICRO ELECTRO OR MICROELECTRO) (W
) MECHANICAL OR MICRO ELECTROMECHANICAL OR MEMS
L44 448715 SEA ELECTRODE#
L47 276298 SEA ELECTROCHEMICAL? OR ELECTRO CHEMICAL?
L55 ...12 SEA L39(10A) L40 AND (L41 OR L42 OR L43) AND L44 *

=> s (153 or 155) not 138
L62 ...22 (L53 OR L55) NOT L38 *previously printed w/ inventor search*

=> fil biosis

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=> d que 136; s 136 not 127

L28 27736 SEA FILE=BIOSIS ABB=ON REDOX OR (OXIDATION (A) REDUCTION)
L30 1692 SEA FILE=BIOSIS ABB=ON SEMICONDUCTOR# OR INTEGRATED(A)
CIRCUIT#
L31 133 SEA FILE=BIOSIS ABB=ON MICROELECTROMECHANICAL OR (MICRO
ELECTRO OR MICROELECTRO) (W)MECHANICAL OR MICRO ELECTROMECHANICA
L OR MEMS
L32 52878 SEA FILE=BIOSIS ABB=ON ELECTRODE#
L36 7 SEA FILE=BIOSIS ABB=ON L28 AND (L30 OR L31) AND L32

L60 7 L36 NOT L27 *previously printed*

=> fil cap1; d que 126

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L18 435411 SEA FILE=CAPLUS ABB=ON SEMICONDUCTOR# OR INTEGRATED(A)
CIRCUIT#
L19 3049 SEA FILE=CAPLUS ABB=ON MICROELECTROMECHANICAL OR (MICRO
ELECTRO OR MICROELECTRO) (W)MECHANICAL OR MICRO ELECTROMECHANICA
L OR MEMS
L20 220806 SEA FILE=CAPLUS ABB=ON ELECTRODE#/OBI
L21 810 SEA FILE=CAPLUS ABB=ON DETECTION(2A)CIRCUIT?
L22 3318 SEA FILE=CAPLUS ABB=ON BIAS(2A)(CONTROL# OR POTENTIAL#)
L23 250404 SEA FILE=CAPLUS ABB=ON ELECTROCHEMICAL?
L26 12 SEA FILE=CAPLUS ABB=ON L16 AND (L18 OR L19) AND L20 AND L17
AND (L21 OR L22 OR L23)

=> fil wpids; d que 111; d que 113

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L2 479545 SEA FILE=WPIDS ABB=ON SEMICONDUCTOR# OR SEMI CONDUCTOR#
L3 99554 SEA FILE=WPIDS ABB=ON INTEGRATED CIRCUIT#
L4 978 SEA FILE=WPIDS ABB=ON MICROELECTROMECHANICAL OR (MICRO
ELECTRO OR MICROELECTRO) (W) MECHANICAL OR MICRO ELECTROMECHANICA
L OR MEMS
L5 434996 SEA FILE=WPIDS ABB=ON ELECTRODE#
L8 26361 SEA FILE=WPIDS ABB=ON ELECTROCHEMICAL OR ELECTRO CHEMICAL
L9 408057 SEA FILE=WPIDS ABB=ON BIOSENSOR# OR SENSOR#
L11 6 SEA FILE=WPIDS ABB=ON L1 AND (L2 OR L3 OR L4) AND L5 AND L9
AND L8 *

L1 9914 SEA FILE=WPIDS ABB=ON REDOX OR (OXIDATION(A) REDUCTION)
L2 479545 SEA FILE=WPIDS ABB=ON SEMICONDUCTOR# OR SEMI CONDUCTOR#
L3 99554 SEA FILE=WPIDS ABB=ON INTEGRATED CIRCUIT#
L4 978 SEA FILE=WPIDS ABB=ON MICROELECTROMECHANICAL OR (MICRO
ELECTRO OR MICROELECTRO) (W) MECHANICAL OR MICRO ELECTROMECHANICA
L OR MEMS
L5 434996 SEA FILE=WPIDS ABB=ON ELECTRODE#
L6 18104 SEA FILE=WPIDS ABB=ON DETECTION(2A)CIRCUIT#
L7 4937 SEA FILE=WPIDS ABB=ON BIAS (2A) (CONTROL OR POTENTIAL)
L13 1 SEA FILE=WPIDS ABB=ON L1 AND (L2 OR L3 OR L4) AND L5 AND (L6
OR L7)

=> s (l11 or l13) not l14

L61 5 (L11 OR L13) NOT L14 *previously
printed*

=> dup rem 126,160,161,162

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PROCESSING COMPLETED FOR L60
PROCESSING COMPLETED FOR L61
PROCESSING COMPLETED FOR L62

L63 ANSWER 1 OF 40 DUP REM L26 L60 L61 L62 (6 DUPLICATES REMOVED) : #
ANSWERS '1-12' FROM FILE CAPLUS
ANSWERS '13-19' FROM FILE BIOSIS
ANSWERS '20-24' FROM FILE WPIDS
ANSWERS '25-26' FROM FILE PASCAL
ANSWER '27' FROM FILE JICST-EPLUS
ANSWERS '28-33' FROM FILE INSPEC
ANSWERS '34-36' FROM FILE COMPENDEX
ANSWERS '37-40' FROM FILE SCISEARCH

=>adbib ab 163 1-40;fil hom

L63 ANSWER 1 OF 40 CAPLUS COPYRIGHT 2002 ACS DUPLICATE 3
ACCESSION NUMBER: 1987:632363 CAPLUS
DOCUMENT NUMBER: 107:232363
TITLE: Light addressable **semiconductor**
sensor for immunoassays
AUTHOR(S): McConnell, Harden M.; Parce, J. Wallace; Hafeman, Dean G.
CORPORATE SOURCE: Mol. Dev. Corp., Palo Alto, CA, 94304, USA
SOURCE: Proceedings - Electrochemical Society (1987),
87-9(Proc. Symp. Chem. Sens.), 292-300
CODEN: PESODO; ISSN: 0161-6374
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A reverse-bias **semiconductor** in contact with an electrolyte
soln. contg. a counter electrode acts as a photosensitive capacitor. The
a.c. photocurrent produced in this system depends on the reverse
bias potential and this is detd. in part by the surface
potential of the **semiconductor**. The surface potential in turn
can be affected by various biochem.-biophys. events, such as changes in

pH, redox potential, or transmembrane potential. Applications of a device of this kind to immunol. assays are described.

L63 ANSWER 2 OF 40 CAPLUS COPYRIGHT 2002 ACS
 ACCESSION NUMBER: 2002:72382 CAPLUS
 DOCUMENT NUMBER: 136:115068
 TITLE: Multimeric biopolymers as structural elements,
 sensors and actuators in microsystems
 INVENTOR(S): Madou, Marc; Bachas, Leonidas G.; Daunert, Sylvia
 PATENT ASSIGNEE(S): The Ohio State University Research Foundation, USA;
 University of Kentucky Research Foundation
 SOURCE: PCT Int. Appl., 26 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002006789	A2	20020124	WO 2001-US22224	20010713
WO 2002006789	A3	20020411		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
AU 2001080552	A5	20020130	AU 2001-80552	20010713
US 2002068295	A1	20020606	US 2001-905041	20010713
PRIORITY APPLN. INFO.:			US 2000-218036P P	20000713
			WO 2001-US22224 W	20010713

AB Biomol. complexes hereinafter referred to as multimeric biopolymers are described which can be used as the foundation of chem. control systems capable of both sensing the presence of a target analyte and actuating some mech. response. The biomol. complexes are multimeric biopolymers comprising at least two monomeric units. The monomeric units are selected from the group consisting of full-length proteins, polypeptides, nucleic acid mols., and peptide nucleic acids. At least one of the monomeric units binds to the target analyte. In one highly preferred embodiment the multimeric biopolymers of the present invention undergo a detectable conformational change in response to exposure to an analyte. The present invention also provides micromachined and nanomachined devices and systems which employ the multimeric biopolymers to sense the presence of a target analyte, to actuate a response to the presence of a target analyte, or the perform both functions.

L63 ANSWER 3 OF 40 CAPLUS COPYRIGHT 2002 ACS
 ACCESSION NUMBER: 2001:816841 CAPLUS
 DOCUMENT NUMBER: 135:355001
 TITLE: Biological identification system with
 microelectromechanical system and
 integrated circuit-based
 biosensor chip
 INVENTOR(S): Gau, Jen, Jr.
 PATENT ASSIGNEE(S): USA
 SOURCE: PCT Int. Appl., 84 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001083674	A1	20011108	WO 2001-US14257	20010502
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
US 2002123048	A1	20020905	US 2001-848727	20010503

PRIORITY APPLN. INFO.:

AB A microelectromech. system (**MEMS**) and integrated circuit based **biosensor** (210) capable of sensing or detecting various ionic mols. and macromols. (DNA, RNA, or protein) is provided. The **MEMS**-based **biosensor** may utilize a hybridization and enzyme amplification scheme and an **electrochem.** detection scheme for sensitivity improvement and system miniaturization. The **biosensor** or **biosensors** are incorporated on a single substrate. Preferably, the **biosensor** system comprises at least two electrodes. The electrodes may comprise a working electrode, a ref. electrode, and a counter (auxiliary) electrode. The **biosensor** or **biosensors** also provide an app. and method for confinement of reagent and/or soln. in the **biosensor** or **biosensors** using surface tension at small scale. The confinement system provides controlled contacts between the reagent(s) and/or soln.(s) with the components (i.e., electrodes) of the **biosensor** or **biosensors** using controllable surface properties and surface tension forces. The confinement system allows for incorporation of the **biosensor** or **biosensors** into a portable or handheld device and is immune to shaking and/or flipping. The invention also provides for a **biosensor** and/or **sensors** that are integrated with integrated circuit (IC) technologies. Preferably, the entire **sensor** system or systems are fabricated on a single IC substrate or chip and no external component and/or instrument is required for a complete detection system or systems. Preferably, the **sensor** system or systems are fabricated using the IC process on a silicon substrate. High specificity for Escherichia coli was achieved using ssDNA-rRNA hybridization and high sensitivity was achieved using enzymic amplification with peroxidase as the enzyme. The detection system was capable of detecting 1000 E. coli cells without PCR with high specificity for E. coli vs. the bacteria Bordetella bronchiseptica.

REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L63 ANSWER 4 OF 40 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 2000:114544 CAPLUS

DOCUMENT NUMBER: 132:144182

TITLE: **Electrochemical** modulation of a waveguide interferometer

AUTHOR(S): Ramos, Brigitte L.; Nagy, Geza; Choquette, Steven J.

CORPORATE SOURCE: Dep. Chem. Biochem., Denison Univ., Granville, OH, 43023, USA

SOURCE: Electroanalysis (2000), 12(2), 140-146

CODEN: ELANEU; ISSN: 1040-0397

PUBLISHER: Wiley-VCH Verlag GmbH

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A planar waveguide implementation of a Mach-Zehnder interferometer coated with a thin semiconducting film was fabricated. The semiconducting film was used as an electrode providing a device that can be used as an electrooptical **sensor**. Changes in the refractive index profile occurring in the immediate vicinity of the waveguide surface resulting from a potential scan can be detected by a shift in the interference pattern imaged across the face of a diode array. This report describes the fabrication of the integrated electrooptical device, the electrochem. and phase response of 7-dimethylamino-1,2-benzophenoxazine (Meldola Blue).

REFERENCE COUNT: 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L63 ANSWER 5 OF 40 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 1996:656965 CAPLUS

DOCUMENT NUMBER: 125:296650

TITLE: **Electrochemical** system for rapid detection of biochemical agents that catalyze a **redox** potential change

INVENTOR(S): Song, Herking; Hafeman, Dean G.

PATENT ASSIGNEE(S): Molecular Devices Corporation, USA

SOURCE: U.S., 42 pp.

CODEN: USXXAM

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5567302	A	19961022	US 1995-483249	19950607

AB The present invention relates to a system for detecting, in a reliable, precise and highly sensitive manner, biochem. agents such as enzymes that catalyze a **redox** potential change. One electrode is used to measure **redox** potential changes in an aq. electrolyte contg. the biochem. agents. Another electrode is used to deliver a feedback current to the electrolyte in response to measured changes in electrolyte **redox** potential. The amt. of feedback current or charge delivered through the electrode to the electrolyte is sufficient in magnitude to maintain a const. **redox** potential. Quantitation of the amt. of feedback current or charge necessary to maintain the const. **redox** potential may then be used to det. the amt. of biochem. agents present. Alternatively, the **redox** potential need not be kept const., but instead may be allowed to reach a new steady-state. Thus, the current, or charge, conducted by a feedback electrode to maintain a new steady-state potential in the presence of an enzymic reaction may be used to quantitate the amt. of enzymic activity present. The present invention provides precision in the quantitation results, high sensitivity in enzyme detection, and a wider dynamic range for quantitation of the biochem. agent. The invention is esp. useful for the detn. of enzyme labels used in immunoassays, e.g., .beta.-D-galactosidase, horseradish peroxidase, alk. phosphatase, and glucose oxidase.

L63 ANSWER 6 OF 40 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 1996:214557 CAPLUS

DOCUMENT NUMBER: 124:336936

TITLE: **Redox** coenzyme functionalization of electrochemically grown Prussian blue films

AUTHOR(S): Komplin, Glenn C.; Pietro, William J.

CORPORATE SOURCE: Department of Chemistry, York University, 4700 Keele Street, North York (Toronto), ON, M3J 1P3, Can.

SOURCE: Sensors and Actuators, B: Chemical (1996), B30(3),

173-8

CODEN: SABCEB; ISSN: 0925-4005

PUBLISHER:

Elsevier

DOCUMENT TYPE:

Journal

LANGUAGE:

English

AB Thin solid films of the mol. **semiconductor** rubidium Prussian blue, RbFe₂(CN)₆, are **electrochem.** deposited on quartz-crystal microbalance electrodes. The films are found to surface-coordinate tightly both the oxidized and reduced forms of the **redox** coenzyme NAD (NAD⁺), presumably via the diphosphate linkage. Gravimetric and electrode potential measurements provide evidence that the surface-bound NAD⁺ can act as an electron-transfer mediator from soln. to the Prussian blue. The electron transfer appears to result from an inner-sphere mechanism between NADH and Fe₂(CN)₆⁻; unbound NADH in soln. does not reduce the Prussian blue films. Conversion of surface-bound NAD⁺ to NADH can be enacted enzymically, with subsequent electron transfer regenerating NAD⁺. The semiconductive properties of the film transport surface electrons to the bulk, enabling near-quant. redn., with the bound coenzyme acting catalytically as an electron-transfer mediator. The potential application of these coenzyme-functionalized mol. **semiconductor** films to the area of biosensing is explored.

L63 ANSWER 7 OF 40 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 1996:353815 CAPLUS

DOCUMENT NUMBER: 125:74768

TITLE: Ion beam synthesis of iodide-sensitive membranes

AUTHOR(S): Keller, Patrick

CORPORATE SOURCE: Inst. Radiochem., Forschungszent. Karlsruhe G.m.b.H., Karlsruhe, D-76021, Germany

SOURCE: Wissenschaftliche Berichte - Forschungszentrum Karlsruhe (1995), FZKA 5672, 1-99 pp.

CODEN: WBFKF5; ISSN: 0947-8620

DOCUMENT TYPE: Report

LANGUAGE: German

AB An iodide-sensitive AgI membrane used as **electrochem.** **sensor** in ion-selective electrodes (ISE) or field effect structures was prep'd. by ion beam synthesis. EIS structures (electrolyte/isolator/**semiconductor**) with ideal stoichiometry were prep'd. by backscattered implantation of AgI mols. into SiO₂ substrates. The ISE was fabricated by ion implantation of I into an Ag substrate; the optimization of the prepn. conditions made it possible to limit the sputtering losses which competed with implantation. The total amt. of implanted ions and their distribution were detd. by RBS. The membranes on Ag substrates exhibited the typical properties of ISE such as high selectivity, good long-term stability, and nearly Nernstian sensitivity and could be miniaturized and integrated as microsensors in anal. microsystems.

L63 ANSWER 8 OF 40 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 1991:78198 CAPLUS

DOCUMENT NUMBER: 114:78198

TITLE: A **biosensor** containing **electrodes**,

INVENTOR(S): enzyme, hydrophilic molecule, electron acceptor, and interfering substance-removing reagent Kawaguri, Mariko; Fujita, Mayumi; Nankai, Shiro; Iijima, Takashi

PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 02245650	A2	19901001	JP 1989-67064	19890317
JP 08020400	B4	19960304		

AB A **biosensor** comprises: (1) a test electrode and a counter electrode, both of which are installed on an insulating base plate; (2) a reaction reagent layer contg. **redox** enzyme, hydrophilic macromol., and electron acceptor (optionally also surfactant), which is immobilized on the electrodes; and (3) an interfering substance-removing reagent part contg. oxidn. agent or enzyme, which can be located beside or on top of the electrodes. When the analyte in a sample reacts with the reagent of the **biosensor**, the change in the reagent becomes an **electrochem.** signal for the electrodes to indicate the analyte concn. Thus, a **biosensor** for detecting glucose was made by installing electrodes on a polyethylene terephthalate base plate by **integrated circuit** manufg. technique, coating with CM-cellulose as hydrophilic macromol., glucose oxidase as reaction reagent, K₃[Fe(CN)₆]-toluene soln. as electron acceptor, and coating KIO₄ as interfering substance-removing reagent in the area beside the electrodes-reagent part. 2 Min after a serum sample was dropped on the **biosensor**, a 0.6 V potential was applied to the electrodes for measuring the elec. current in 5 s. The glucose concn. could be detd. by comparing the elec. current measured for the sample with that for std. glucose solns.

L63 ANSWER 9 OF 40 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 1989:84150 CAPLUS
 DOCUMENT NUMBER: 110:84150
 TITLE: Selective Nernstian response of poly(N,N-dimethylaniline)-poly(o-chloroaniline) dual-layer coated **electrode** to dissolved iodide ion
 Yano, Jun; Tanaka, Takaaki
 AUTHOR(S):
 CORPORATE SOURCE: Fac. Educ., Yamanashi Univ., Kofu, 400, Japan
 SOURCE: Chemistry Letters (1988), (12), 1943-6
 CODEN: CMLTAG; ISSN: 0366-7022

DOCUMENT TYPE: Journal
 LANGUAGE: English

AB Poly(N,N-dimethylaniline) (PDA) is a **semiconductor** having pos. charged sites in the polymeric backbone. A PDA-coated electrode can capture I⁻ electrostatically and the I⁻ in the PDA film can also be oxidized **electrochem.** Poly(o-chloroaniline) (PCA) responses to dissolved I⁻ selectively, though it is quite an insulator. A PDA/PCA dual-layer coated electrode shows selective Nernstian response to dissolved I⁻.

L63 ANSWER 10 OF 40 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 1982:578224 CAPLUS
 DOCUMENT NUMBER: 97:178224
 TITLE: Organic **electrochemical** techniques having potential clinical application
 Durst, R. A.; Blubaugh, E. A.; Bunding, K. A.; Fultz, M. L.; MacCrehan, W. A.; Yap, W. T.
 AUTHOR(S):
 CORPORATE SOURCE: Cent. Anal. Chem., Natl. Bur. Stand., Washington, DC, 20234, USA
 SOURCE: Clin. Chem. (Winston-Salem, N. C.) (1982), 28(9), 1922-30
 CODEN: CLCHAU; ISSN: 0009-9147

DOCUMENT TYPE: Journal
 LANGUAGE: English

AB The Org. **Electrochem.** Group at the National Bureau of Stds. is pursuing several avenues of research of potential application to problems of clin. chemists. With one development, **electrochem.** detectors

for liq. chromatog., organomercury species can be detd. in biol. tissues and other matrices. Spectroelectrochem. is being used to characterize the **redox** behavior of metal complexes of bleomycin, an antitumor drug. Chem. modified electrodes are being developed as selective electrocatalytic **sensors** for organohalogen compds. and may lead to new **sensors** for clin. important analytes. Surface-enhanced Raman spectroscopy is helping characterize the polymer films used to modify the electrode surfaces. Another **sensor** is being developed for the detection of carboxylic acids; after the photocatalytic oxidn. of the acids at a **semiconductor** electrode, the CO₂ produced is subsequently detd. with a flow-through gas-sensing electrode. Finally, math. modeling may provide a better understanding of the fundamental processes involved in several of the above techniques.

L63 ANSWER 11 OF 40 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 1980:208304 CAPLUS
 DOCUMENT NUMBER: 92:208304
 TITLE: Chalcogenide glasses as ion-selective materials for solid-state **electrochemical sensors**
 AUTHOR(S): Owen, A. E.
 CORPORATE SOURCE: Dep. Electr. Eng., Univ. Edinburgh, Edinburgh, Scot.
 SOURCE: J. Non-Cryst. Solids (1980), 35-36(2), 999-1004
 CODEN: JNCSBJ; ISSN: 0022-3093
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 AB Semiconducting chalcogenide glasses were studied for use as membrane materials for solid-state microelectronic electrodes. Chalcogenide glasses based on As selenide or selenide/telluride, and contg. up to 25 mol % of an appropriate metal, were successfully used as ion-selective electrodes for Cu(II) and Pb(II) ions. They gave a Nernstian response over the range 10-1-10-5M or 10-6 M and, in the case of the Cu-**sensor**, were highly reproducible and durable. The ion-selective mechanism is probably a **redox**-like process involving the exchange of 2 electrons.

L63 ANSWER 12 OF 40 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 1977:80764 CAPLUS
 DOCUMENT NUMBER: 86:80764
 TITLE: Studies of solid-state ion-selective **electrodes** prepared from semiconducting organic radical-ion salts
 AUTHOR(S): Sharp, Michael
 CORPORATE SOURCE: Dep. Anal. Chem., Univ. Umea, Umea, Swed.
 SOURCE: Anal. Chim. Acta (1976), 85(1), 17-30
 CODEN: ACACAM
 DOCUMENT TYPE: Journal
 LANGUAGE: English

AB The primary **redox** reactions for solid-state ion-selective electrodes prep'd. from electronically semiconducting salts of 7,7,8,8-tetracyanoquinodimethan (TCNQ) can be identified by considering the **redox** properties of their constituent ions or mols. Three different processes involving the couples, Mn⁺/M₀, 2 TCNQ⁰/(TCNQ⁻)₂ and (TCNQ⁻)₂/2 TCNQ²⁻ are possible depending on salt compn. Ionic product values detd. by potentiometric (pot.) and at.absorption (AAS) methods are in excellent agreement for several such salts; K_s(K₂TCNQ₂) : 5.8 .+-. 1.2 .times. 10-11 (pot.), 1.7 .+-. 1 .times. 10-11 (AAS); K_s(CdTCNQ₂) = 3.0 .+-. 0.5 .times. 10-9 (pot.), 2.9 .+-. 0.3 .times. 10-9 (AAS); K_s(PbTCNQ₂) = 1.3 .+-. 0.3 .times. 10-10 (pot.), 0.96 .+-. 0.2 .times. 10-10 (AAS); and indicate that the lower activity limit for electrode response is controlled by the solv. of the **sensor** material itself. Comparisons of predicted and obsd. std. electrode potentials provide quant. support for an ion-exchange mechanism of interference. The behavior of electrodes prep'd. from Cu₂TCNQ₂ (Cu(I)) and CuTCNQ₂ (Cu(II))

is explained on the basis of an interference mechanism and considerations of solid-state equilibria.

L63 ANSWER 13 OF 40 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
ACCESSION NUMBER: 2000:352748 BIOSIS
DOCUMENT NUMBER: PREV200000352748
TITLE: Multiplexing of microelectrode arrays in voltammetric measurements.
AUTHOR(S): Hintsche, Rainer (1); Albers, Joerg; Bernt, Helmut; Eder, Alfred
CORPORATE SOURCE: (1) Fraunhofer-Institut fuer Siliziumtechnologie, Fraunhoferstr. 1, D-25524, Itzehoe Germany
SOURCE: Electroanalysis, (May, 2000) Vol. 12, No. 9, pp. 660-665. print.
ISSN: 1040-0397.

DOCUMENT TYPE: Article

LANGUAGE: English

SUMMARY LANGUAGE: English

AB Multipotentiostats are the equipment commonly used for voltammetric measurements with multichannel **electrode** arrays, because the conditioning of the working **electrodes** does not allow fast multiplexing for measuring current responses. In this article, multiplexing and serial read-out of **electrode** arrays using a simple potentiostat and **integrated circuits** are shown. Several specially constructed switches, which were integrated in an application specific **integrated circuit** (ASIC) in complementary metal oxide **semiconductor** (CMOS) technology, allow **electrode** potentials to be applied as if by a potentiostat during the read-out time as well as continuously applying a bias voltage during stand-by. The application of multiplexing and serial read-out is demonstrated by **redox** recycling of p-aminophenol in an interdigitated microelectrode array made in silicon technology. Here, a bipotentiostat generates two different potentials that are addressed by the ASIC to the anodes and cathodes for **redox** recycling. The results show the same quality as those using a multipotentiostat.

L63 ANSWER 14 OF 40 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.

ACCESSION NUMBER: 1998:341940 BIOSIS
DOCUMENT NUMBER: PREV199800341940
TITLE: Primary cathodic steps of electrogenerated chemiluminescence of lanthanide(III) chelates at oxide-covered aluminum **electrodes** in aqueous solution.
AUTHOR(S): Kulmala, S. (1); Kulmala, A.; Ala-Kleme, T.; Pihlaja, J.
CORPORATE SOURCE: (1) Dep. Chem., Univ. Turku, FIN-20014 Turku Finland
SOURCE: Analytica Chimica Acta, (July 3, 1998) Vol. 367, No. 1-3, pp. 17-31.
ISSN: 0003-2670.

DOCUMENT TYPE: Article

LANGUAGE: English

AB The primary processes occurring at cathodically polarized oxide-covered aluminum **electrode** are discussed in detail. It is pointed out that more energetic cathodic processes can be induced in aqueous media at thin insulating film-coated **electrodes** than at any **semiconductor** or active metal **electrode**. It is proposed that tunnel emission of hot electrons with energies well above the level of the conduction band edge of water occur, and the thermalization and salvation of the emitted electrons can result in generation of hydrated electrons. The cathodically pulse-polarized oxide-covered aluminum also generates a strong oxidant (or oxidants) at the oxide/electrolyte interface, and it is proposed that this species is the hydroxyl radical which is generated either by cathodic high field-induced ejection of self-trapped holes as oxygen dianions (i.e. oxide radical ions) into the

electrolyte solution, or by the action of anion vacancies and/or F⁺-centers as the primary oxidants capable of oxidizing hydroxide ions or the hydroxyl groups of the hydroxylated surface on the oxide film. These radicals, hydrated electrons/hydroxyl radicals, can act as mediating reductants/oxidants in reduction/oxidation of solutes.

The formation of the primary species is monitored by electrochemiluminophores which cannot be cathodically excited at active metal electrodes in fully aqueous solutions, but which can be chemically excited in aqueous media in the simultaneous presence of highly reducing and highly oxidizing radicals.

L63 ANSWER 15 OF 40 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.

ACCESSION NUMBER: 1997:437468 BIOSIS

DOCUMENT NUMBER: PREV199799736671

TITLE: Interaction of horse heart cytochrome c with lipid bilayer membranes: Effects on redox potentials.

AUTHOR(S): Salamon, Zdzislaw; Tollin, Gordon

CORPORATE SOURCE: Dep. Biochem., Univ. Arizona, Tucson, AZ 85721 USA

SOURCE: Journal of Bioenergetics and Biomembranes, (1997) Vol. 29, No. 3, pp. 211-221.

ISSN: 0145-479X.

DOCUMENT TYPE: Article

LANGUAGE: English

AB Cyclic voltammetry has been used to study the effects of interactions between horse cytochrome c and solid-supported planar lipid membranes, comprised of either egg phosphatidylcholine (PC) or PC plus 20 mol.% cardiolipin (CL), on the redox potential and the electrochemical electron transfer rate between the protein and a semiconductor electrode. Experiments were performed over a wide range of cytochrome c concentrations (0-440 μM) at low (20 mM) and medium (160 mM) ionic strengths. Three types of electrochemical behavior were observed, which varied as a function of the experimental conditions. At very low cytochrome c concentration (approx 0.1 μM), and under conditions where electrostatic forces dominated the protein-lipid membrane interaction (i.e., low ionic strength with membranes containing CL), a redox potential (approx 265 mV) and an electrochemical electron transfer rate constant (0.09 s⁻¹) were obtained which compare well with those measured in other laboratories using a variety of different chemical modifications of the working electrode. Two other electrochemical signals (not reported with chemically modified electrodes) were also observed to occur at higher cytochrome c concentrations with this membrane system, as well as with two other systems (membranes containing CL under medium ionic strength conditions, and PC only at low ionic strength). These involved positive shifts of the cytochrome c redox potential (by 40 and 60 mV) and large decreases in the electron transfer rate (to 0.03 and 0.003 s⁻¹). The observations can be rationalized in terms of a structural model of the cytochrome c-membrane interaction, in which association involves both electrostatic and hydrophobic forces and results in varying degrees of insertion of the protein into the hydrophobic interior of the membrane.

L63 ANSWER 16 OF 40 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.

ACCESSION NUMBER: 1996:541134 BIOSIS

DOCUMENT NUMBER: PREV199699263490

TITLE: Possible role of surface electrochemical electron-transfer and semiconductor charge transport processes in ion channel function.

AUTHOR(S): Cavelier, German

CORPORATE SOURCE: Electrical Eng. Dep., Univ. Los Andes, AA 4976, Cra. 1 No. 18A-70, Santa Fe de Bogota, D.C. Colombia

SOURCE: Bioelectrochemistry and Bioenergetics, (1996) Vol. 40, No. 2, pp. 197-213.

ISSN: 0302-4598.

DOCUMENT TYPE: Article
LANGUAGE: English

AB Conductivity measurements and theoretical electronic structure calculations have been made in proteins, the calculations giving allowed energies for electrons that would enable them to participate in charge transport processes, probably by hopping and with close similarity to amorphous semiconductors. These theoretical computations have confirmed that the experimental results are probably due to electronic conduction. The foregoing considerations allow us to describe the protein-electrolyte interface as a semiconductor-electrolyte interface. Electron-transfer (ET) at such interfaces has been studied and experimentally established to occur from semiconductor electronic energy states to redox energy states in solution, or to redox surface states. ET has also been measured between organic and biochemical conducting compounds (particularly proteins and conducting membranes) and electrodes or redox solutions. Therefore, it is assumed in this paper that ET occurs at the ion channel protein interfaces with the cytoplasm and extracellular electrolytes, and that electron transport processes occur through the channel alpha-helices. A possible ET mechanism is proposed involving surface state oxygen-derived free radicals like superoxide. The mathematical expressions for the biophysical phenomena discussed give two time-varying interface potentials and charge distributions that could provide the energy for the conformational changes that open and close the channel; these potentials could also change the ion permeation energy barriers by electrostatic influence. An expression is thus obtained for channel conductance as a function of membrane and interface potentials. Using this expression for sodium and potassium complemented by the usual passive components, gives a mathematical model that produces action potentials, intrinsic repetitive firing, and bursting, all of which can be modulated by changes in the biophysical parameters. Implications for ionic channel voltage gating are discussed and compared with existing experimental results and models. The possible relationships with redox and oxygen sensitivities, superoxide oxidative stress and neurotoxicity, drug and neurotransmitter effects, and ionic channel modulation are also discussed.

L63 ANSWER 17 OF 40 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
ACCESSION NUMBER: 1993:406434 BIOSIS
DOCUMENT NUMBER: PREV199396072159
TITLE: Direct measurement of cyclic current-voltage response of integral membrane proteins at a self-assembled lipid-bilayer-modified electrode: Cytochrome f and cytochrome c oxidase.
AUTHOR(S): Salamon, Z.; Hazzard, J. T.; Tollin, G. (1)
CORPORATE SOURCE: (1) Dep. Biochem., University Arizona, Tucson, AZ 85791 USA
SOURCE: Proceedings of the National Academy of Sciences of the United States of America, (1993) Vol. 90, No. 14, pp. 6420-6423.
ISSN: 0027-8424.
DOCUMENT TYPE: Article
LANGUAGE: English
AB Direct cyclic voltage-current responses, produced in the absence of redox mediators, for two detergent-solubilized integral membrane proteins, spinach cytochrome f and beef heart cytochrome c oxidase, have been obtained at an optically transparent indium oxide electrode modified with a self-assembled lipid-bilayer membrane. The results indicate that both proteins interact with the lipid membrane so as to support quasi-reversible electron transfer redox reactions at the semiconductor electrode. The redox potentials that were obtained from analysis of the cyclic "voltammograms," 365 mV for cytochrome f and 250 and 380 mV for cytochrome c oxidase (vs. normal hydrogen electrode), compare quite well with the values

reported by using conventional titration methods. The ability to obtain direct electrochemical measurements opens up another approach to the investigation of the properties of integral membrane **redox** proteins.

L63 ANSWER 18 OF 40 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
ACCESSION NUMBER: 1992:71100 BIOSIS
DOCUMENT NUMBER: BA93:39555
TITLE: SIMULATION OF THE ELECTROCHEMICAL BEHAVIOR OF MULTI-
REDOX SYSTEMS CURRENT POTENTIAL STUDIES ON
MULTIHEMЕ CYTOCHROMES.
AUTHOR(S): MORENO C; CAMPOS A; TEIXEIRA M; LEGALL J; MONTENEGRO M I;
MOURA I; VAN DIJK C; MOURA J G J
CORPORATE SOURCE: CTQB-APT 127, P-2780 OEIRAS, PORTUGAL.
SOURCE: EUR J BIOCHEM, (1991) 202 (2), 385-394.
CODEN: EJBCAI. ISSN: 0014-2956.
FILE SEGMENT: BA; OLD
LANGUAGE: English
AB The direct unmediated electrochemical response of the tetrahemic cytochrome c3 isolated from sulfate reducers *Desulfovibrio baculatus* (DSM 1743) and *D. vulgaris* (strain Hildenborough), was evaluated using different **electrode** systems [graphite (edge cut), gold **semiconductor** (In_2O_3) and mercury] and different electrochemical methods (cyclic voltammetry and differential pulse voltammetry). A computer program was developed for the theoretical simulation of a complete cyclic voltammetry curve, based on the method proposed by Nicholson and Shain [Nicholson, R. S. & Shain, I. (1964) Anal. Chem. 36, 706-723], using the Gauss-Legendre method for calculation of the integral equations. The experimental data obtained for this multi-**redox** center protein was deconvoluted in to the four **redox** components using theoretically generated cyclic voltammetry curves and the four mid-point reduction potentials determined. The pH dependence of the four reduction potentials was evaluated using the deconvolution method described.

L63 ANSWER 19 OF 40 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
ACCESSION NUMBER: 1990:105782 BIOSIS
DOCUMENT NUMBER: BA89:55273
TITLE: **REDOX** AND PH-SENSITIVITY IN ION SELECTIVE FIELD TRANSISTORS WITH **SEMICONDUCTORS** FROM ELEMENTS OF THE FOURTH GROUP.
AUTHOR(S): KIYANSKII V V
CORPORATE SOURCE: DIV. INORG. ANAL. CHEM., K.A. TIMIRYAZEV MOSC. AGRIC. ACAD., MOSCOW, USSR.
SOURCE: IZV TIMIRYAZEV S-KH AKAD, (1989) 0 (4), 165-170.
CODEN: ITSAA7. ISSN: 0021-342X.
FILE SEGMENT: BA; OLD
LANGUAGE: Russian
AB An explanation of ion and **oxidation-reduction** sensitivity of semiconducting **electrodes** and ionselective field transistors on the basis of silicon, germanium and silicon carbide based on the ideas about donor-acceptor centres on their surface and hydrogen in the space of semiconducting structures is suggested.

L63 ANSWER 20 OF 40 WPIDS (C) 2002 THOMSON DERWENT
ACCESSION NUMBER: 2002-329454 [36] WPIDS
CROSS REFERENCE: 1998-032826 [03]
DOC. NO. NON-CPI: N2002-258617
DOC. NO. CPI: C2002-095133
TITLE: Photoelectrochemical-electrochromic device for modulating transmittance of light comprising electrolyte layer with **redox** couple to oxidize and produce electric field across device when light applied.

DERWENT CLASS: E24 L03 P81 P85 Q48 U14 V07
 INVENTOR(S): BECHINGER, C S; GREGG, B A
 PATENT ASSIGNEE(S): (MIDE) MIDWEST RES INST
 COUNTRY COUNT: 96
 PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG
WO 2002010852	A1	20020207	(200236)*	EN	28
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW					
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW					
US 6369934	B1	20020409	(200236)		
AU 2001082921	A	20020213	(200238)		
EP 1247137	A1	20021009	(200267)	EN	
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI TR					

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
WO 2002010852	A1	WO 2001-US22823	20010719
US 6369934	B1 CIP of	US 1996-655724	19960530
		US 2000-631201	20000801
AU 2001082921	A	AU 2001-82921	20010719
EP 1247137	A1	EP 2001-961675	20010719
		WO 2001-US22823	20010719

FILING DETAILS:

PATENT NO	KIND	PATENT NO
AU 2001082921	A Based on	WO 200210852
EP 1247137	A1 Based on	WO 200210852

PRIORITY APPLN. INFO: US 2000-631201 20000801; US 1996-655724
19960530

AB WO 200210852 A UPAB: 20021018

NOVELTY - A photoelectrochemical-electrochromic device comprises an electrolyte layer with **redox** couple. The electrolyte layer provides lateral ionic conductivity that darkens the electrochromic material when electrolyte is struck with light. As light is applied, the **redox** couple oxidizes to produce electric field across the device, which modulates effective light transmittance in electrochromic material.

DETAILED DESCRIPTION - A photoelectrochemical-electrochromic device comprises two transparent **electrodes** (12, 14), layer of electrochromic material (16), nanoporous **semiconductor** film (18), and electrolyte (22) layer. The **electrodes** are parallel yet apart. The **semiconductor** film has light absorbing light, which enhances the absorption of light in specific spectral range. The electrolyte layer has a selected thickness to provide lateral ionic conductivity that darkens an entire adjacent layer of electrochromic material when light strikes any portion of electrolyte contacting the electrochromic material layer and nanoporous **semiconductor** dye. The electrolyte layer has **redox** couple, such that upon application of light, the dye is illuminated by absorption of light and the **redox** couple oxidizes to produce an electric field across the device which modulates effective light transmittance in electrochromic material. The device and electrochromic material spontaneously bleaching

upon removal of light as a result of illuminated oxidized dye causing the chemically reversible oxidation on ions in the electrolyte.

An INDEPENDENT CLAIM is also included for a method of modulating the transmittance of light comprising electrically connecting the two transparent electrodes.

USE - For modulating a transmittance of light entering a window in commercial and institutional buildings, automobile glass, airplane and aerospace applications, sunglasses, and as protection of solar concentrators.

ADVANTAGE - The device is self-powered to modulate the transmittance of light entering a window without needing external power supplies. Reduces air conditioning costs, glare and ultraviolet damage while increasing comfort, and thus productivity of persons inside the building. Eliminates irradiation sensors, but provides continuously variable transmission.

DESCRIPTION OF DRAWING(S) - The drawing shows a perspective view of the a window incorporating the device.

Transparent electrodes 12, 14

Layer of electrochromic material 16

Nanoporous semiconductor film 18

Electrolyte 22

Dwg.1/5

L63 ANSWER 21 OF 40 WPIDS (C) 2002 THOMSON DERWENT
 ACCESSION NUMBER: 2001-648168 [74] WPIDS
 DOC. NO. NON-CPI: N2001-484360
 DOC. NO. CPI: C2001-191171
 TITLE: Insulated nanoscopic pathway articles, for use as sensors for variety of analytes, comprises nanoscopic pathway having conductivity, dielectric insulating nanoscopic pathway, and nanoscopic switch which alters nanoscopic pathway.
 DERWENT CLASS: A26 A85 B04 D16 X12
 INVENTOR(S): SWAGER, T M
 PATENT ASSIGNEE(S): (SWAG-I) SWAGER T M; (MASI) MASSACHUSETTS INST TECHNOLOGY
 COUNTRY COUNT: 22
 PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG
WO 2001057140	A1	20010809	(200174)*	EN	79
RW: AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR					
W: CA JP					
US 2002040805 A1 20020411 (200227)					

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
WO 2001057140	A1	WO 2001-US3784	20010205
US 2002040805	A1 Provisional	US 2000-180357P	20000204
		US 2001-777725	20010205

PRIORITY APPLN. INFO: US 2000-180357P 20000204; US 2001-777725
 20010205

AB WO 200157140 A UPAB: 20011217

NOVELTY - An article (I), comprising a nanoscopic pathway having conductivity, a dielectric insulating the nanoscopic pathway, and a nanoscopic switch, in electric communication and capable of altering the conductivity of the nanoscopic pathway.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for:

(1) a sensor comprising (I) for detecting an analyte;

(2) a composition comprising a nanoscopic pathway with a resistance of less than 10⁻⁴ times that of a polymer isolating the pathway; and
 (3) a method of altering conductivity comprising providing article (I), insulating the nanoscopic pathway, and activating the nanoscopic switch in the article.

USE - The insulated nanoscopic pathway articles are useful for devices, compositions and methods involving conduction pathways of nanoscopic thickness, especially **sensors** for a variety of electrolytes (claimed).

ADVANTAGE - A **sensor** is provided with improved signal amplification for **sensors** requiring heightened sensitivity.

DESCRIPTION OF DRAWING(S) - The drawing shows a schematic cross-section of an article having a nanoscopic pathway isolated by a dielectric including nanoscopic switches.

Article 2

Nanoscopic pathway 4

Minimum dimension 5

Dielectric 6

Nanoscopic switches 8

Dwg.1/26

L63 ANSWER 22 OF 40 WPIDS (C) 2002 THOMSON DERWENT

ACCESSION NUMBER: 2000-673582 [66] WPIDS

DOC. NO. NON-CPI: N2000-499292

DOC. NO. CPI: C2000-204283

TITLE: Versatile **electrochemical** detector array for laboratory application comprises e.g. computer-addressable noble metal ultra-micro **electrodes** on silicon plate for molecular assay and investigation of charged molecule transport.

DERWENT CLASS: B04 D16 J04 L03 S03 U12 U14

INVENTOR(S): ALBERS, J; BERNT, H; DEHORST, R; HINTSCHE, R; SEITZ, R; BREDEHORST, R

PATENT ASSIGNEE(S): (FRAU) FRAUNHOFER GES FOERDERUNG ANGEWANDTEN

COUNTRY COUNT: 27

PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG
DE 19916921	A1	20001019 (200066)*	23		
WO 2000062047	A1	20001019 (200066)	GE	RW: AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE W: JP US	
WO 2000062048	A2	20001019 (200066)	GE	RW: AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE W: DE JP US	
DE 10080029	T	20010913 (200153)†			
EP 1200817	A2	20020502 (200236)	GE	R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI	

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
DE 19916921	A1	DE 1999-19916921	19990414
WO 2000062047	A1	WO 1999-EP4883	19990712
WO 2000062048	A2	WO 2000-EP3404	20000414
DE 10080029	T	DE 2000-10080029	20000414
EP 1200817	A2	WO 2000-EP3404	20000414
		EP 2000-938598	20000414
		WO 2000-EP3404	20000414

FILING DETAILS:

PATENT NO	KIND	PATENT NO
DE 10080029	T Based on	WO 200062048
EP 1200817	A2 Based on	WO 200062048

PRIORITY APPLN. INFO: DE 1999-19916921 19990414; DE 2000-10080029
20000414

AB DE 19916921 A UPAB: 20001219

NOVELTY - A versatile **electrochemical** detector array comprising computer-addressable noble metal ultra-microelectrodes (**electrodes**) on a silicon plate, is new. **Sensor** locations on plates comprise spaced arrays of ultra-microelectrodes and optionally-arranged auxiliary **electrodes**.

DETAILED DESCRIPTION - A versatile **electrochemical** detector array comprising computer-addressable noble metal ultra-micro **electrodes** on a silicon plate, is new. **Sensor** locations on plates comprise spaced arrays of ultra-microelectrodes (**electrodes**) and optionally-arranged auxiliary **electrodes**

Each position is addressable and electrochemically monitored. As required, alternating or steady electrical fields are produced at each. Individual detection of diverse **electrochemical** reactions or characteristics, or electrical read-out of such prior events, takes place at each **sensor** location. Differing or similar molecules forming an affinity, are immobilized as required at **sensor** positions, or on particular carriers, or in gels at the **sensor** locations, independently of optical characteristics.

USE - The ultra-microsensor **electrode** array on e.g. silicon plates has numerous potential applications in the laboratory, such as for detection of various molecules and mixtures in biochemical analysis, medicinal diagnosis and environmental monitoring.

ADVANTAGE - The array is especially suitable for biochemical affinity assays and is readily constructed using modern **semiconductor** processing technology. Different analytes can be determined simultaneously. Serial readout is achieved, avoiding interference with the measurement process, using a method particularly compatible with computer technology. Miniaturization, manufacturing and handling advantages are realized. Analytic handling of molecular biological assays is improved. Optical techniques are not invoked.

DESCRIPTION OF DRAWING(S) - The figure shows an **electrochemical** detector array in plan view.

carrier plate 1

contact surfaces 2

electronic addresser/decoder 10

Dwg.1a/1

L63 ANSWER 23 OF 40 WPIDS (C) 2002 THOMSON DERWENT
 ACCESSION NUMBER: 1998-032826 [03] WPIDS
 CROSS REFERENCE: 2002-329454 [22]
 DOC. NO. NON-CPI: N1998-026308
 DOC. NO. CPI: C1998-011208
 TITLE: Photo-**electrochemical**-electrochromic device for modulating light transmittance - has electrochromic material applied to one transparent **electrode** and **semiconductor** coating applied to other **electrode**, used in window glass etc..
 DERWENT CLASS: E12 E23 L01 L03 P81 U14 X25
 INVENTOR(S): BECHINGER, C S; GREGG, B A
 PATENT ASSIGNEE(S): (MIDE) MIDWEST RES INST
 COUNTRY COUNT: 31
 PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG
WO 9745767	A1	19971204 (199803)*	EN	28	
RW:	AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE				
W:	AU BR CA CN DE DK ES GB IL JP KP KR MX NO NZ RU SE SG VN				
AU 9731409	A	19980105 (199821)			

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
WO 9745767	A1	WO 1997-US8773	19970527
AU 9731409	A	AU 1997-31409	19970527

FILING DETAILS:

PATENT NO	KIND	PATENT NO
AU 9731409	A Based on	WO 9745767

PRIORITY APPLN. INFO: US 1996-655724 19960530

AB WO 9745767 A UPAB: 20020610

A photo-electrochemical-electrochromic device comprises two parallel, electrically connected transparent electrodes (12,14). The first electrode has an applied electrochromic material (16) and the second electrode has a semiconductor coating (18). An electrolyte layer (22) contacts the electrochromic material and the semiconductor coating. This layer has a redox couple so that when the semiconductor absorbs light the redox couple oxidises producing an electric field across the device modulating its effective light transmittance.

Also claimed is a process for modulating transmittance of light using the above device.

USE - The modulating assembly can be used in windows, automobile glass, airplane and aerospace applications, sunglasses and the protection of solar concentrators. When installed in windows it reduces air conditioning costs, glare and UV damage within the building. It may also be used to store images.

ADVANTAGE - The assembly is self-powered and requires no external electric wiring. Irradiation sensors are not required and continuously variable transmission is available. It does not use valuable window space and modulates depending on the amount of light entering the window, not the amount of light striking its periphery. Transmitted sunlight is decreased by > 70% within one minute.

Dwg.2/5

L63 ANSWER 24 OF 40 WPIDS (C) 2002 THOMSON DERWENT
 ACCESSION NUMBER: 1992-274188 [33] WPIDS
 DOC. NO. NON-CPI: N1992-209638
 DOC. NO. CPI: C1992-122210
 TITLE: Electrochemical element for sensor
 etc. - has island-shape thin metal film forming Schottky junction with semiconductor electrode
 , where ions flow in oxidn.-redn.
 reactions, improving operation speed.
 DERWENT CLASS: L03 P81 P85 U14
 PATENT ASSIGNEE(S): (MATU) MATSUSHITA ELEC IND CO LTD
 COUNTRY COUNT: 1
 PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG
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JP 04188114 A 19920706 (199233)*

4

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
JP 04188114	A	JP 1990-318731	19901122

PRIORITY APPLN. INFO: JP 1990-318731 19901122

AB JP 04188114 A UPAB: 19931006

In an **electrochemical** element on the surface of a **semiconductor electrode** where ions come in or out in **oxidation-reduction** reactions, island shape thin film of a metal which forms Schottky junction with the **semiconductor electrode** is provided.

The **semiconductor** is of transition elements, the operation speed of element is slow due to limitation by supply rate of reactive substance to the surface and **oxidn.-redn.** reaction rate etc.

USE/ADVANTAGE - Used in **sensor** etc. By providing island-shape thin film on the surface of **semiconductor**, operation speed of **electrochemical** element can be increased.
0/0

L63 ANSWER 25 OF 40 PASCAL COPYRIGHT 2002 INIST-CNRS. ALL RIGHTS RESERVED.
DUPLICATE

ACCESSION NUMBER: 1991-0078275 PASCAL
 TITLE (IN ENGLISH): A Nb-doped TiO₂ **semiconductor** pH sensor for use in high-temperature aqueous solutions
 AUTHOR: HARA N.; SUGIMOTO K.
 CORPORATE SOURCE: Tohoku univ., fac. eng., dep. metallurgy, Sendai 980, Japan
 SOURCE: Journal of the electrochemical Society, (1990), 137(8), 2517-2523, 32 refs.
 ISSN: 0013-4651 CODEN: JESOAN
 DOCUMENT TYPE: Journal
 BIBLIOGRAPHIC LEVEL: Analytic
 COUNTRY: United States
 LANGUAGE: English
 AVAILABILITY: INIST-4925, 354000009257770290
 AB A **semiconductor** pH sensor using a Nb-doped TiO₂ single crystal has been developed for pH measurement in high temperature aqueous solutions. The pH response of this sensor is based on the pH-dependent change in the flatband potential, E_{sub}F_{sub}B, of **semiconductor electrode**. The value of E_{sub}F_{sub}B can be obtained by measuring the Mott-Schottky plot on the **semiconductor electrode** in a solution. The measurement of the plots has been done on Nb₂₀sub₅-doped TiO₂ single-crystal **electrodes** with different doping levels in solutions having various composition and pHs at temperatures in the range 298-523 K. The pH response of the **sensor** was fast, stable, and not affected by **redox** systems in the solutions. Interfering effects were observed, however, at higher K⁺ and Na⁺ concentrations

L63 ANSWER 26 OF 40 PASCAL COPYRIGHT 2002 INIST-CNRS. ALL RIGHTS RESERVED.
ACCESSION NUMBER: 1999-0070515 PASCAL

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TITLE (IN ENGLISH): Characterization of the .sup.EMOSFET, a novel one-
electrode chemical transducer for redox measurements

AUTHOR: HENDRIKSE J.; OLTHUIS W.; BERGVELD P.

CORPORATE SOURCE: MESA Research Institute, University of Twente, PO Box 217, 7500AE Enschede, Netherlands
SOURCE: Journal of electroanalytical chemistry: (1992), (1998), 458(1-2), 23-29, 16 refs.
DOCUMENT TYPE: Journal
BIBLIOGRAPHIC LEVEL: Analytic
COUNTRY: Switzerland
LANGUAGE: English
AVAILABILITY: INIST-1150, 354000073064680040

AB A sensor device consisting of a MOSFET with an iridium oxide gate contact and denoted an .sup.EMOSFET is presented. When the gate of this device is in contact with an electrolyte, the iridium oxide can take part in a redox reaction, enabling thermodynamic equilibrium between the electrons in the iridium oxide and protons in the solution. The chemical potential of the electrons in the bulk of the iridium oxide can be changed by oxidation or reduction of the material and is related closely to the iridium oxide work function. Since the threshold voltage, V.sub.T, of the MOSFET depends on the work function difference between the gate contact and the silicon bulk, it is influenced also by the redox reaction. So if this sensor is connected to the appropriate amplifier circuit, the redox reaction induces changes in the output signal of the system due to changes in the threshold voltage, V.sub.T, of the MOSFET. It is shown on a theoretical basis how the output signal is influenced by the redox reaction and this description of the device is supported by measurement results.

L63 ANSWER 27 OF 40 JICST-EPlus COPYRIGHT 2002 JST

ACCESSION NUMBER: 890141317 JICST-EPlus
TITLE: Development of high sensitive sensor system by use of immobilized enzyme and its analytical application.
Preparation of enzyme FET electrode responding to redox potential and its characteristics.
AUTHOR: WASA TAMOTSU; YAO TOSHIO; UENO MASAO
CORPORATE SOURCE: Univ. of Osaka Prefecture, College of Engineering
SOURCE: Asahi Garasu Kogyo Gijutsu Shoreikai Kenkyu Hokoku (Reports of the Asahi Glass Foundation for Industrial Technology), (1988) vol. 52, pp. 219-228. Journal Code: G0061A (Fig. 13, Tbl. 3, Ref. 28)
CODEN: AGKGAA; ISSN: 0365-2599

PUB. COUNTRY: Japan
DOCUMENT TYPE: Journal; Article
LANGUAGE: Japanese
STATUS: New

AB In order to amplify the applicability of chemical sensor using field effect transistor(FET), oxidation/reduction FET electrode (Redox-FET) and enzyme FET electrode which combined specificities of Redox-FET and enzyme were made and the following results were obtained: 1) Redox-FET electrode by sputtering Pt on the gate of ion sensitive FET had enough mechanical strength and Nernstian response (58-60mV/decade) to hexacyanoferrate (II/III) system. 2) Hydrogen peroxide (FET) electrode immobilized peroxidase (POD) showed Nernstian response to 0.002-1mM hydrogen peroxide in buffer solution (pH9.0) containing 10-50mM hexacyanoferrate (II). 3) Glucose (FET) electrode co-immobilized glucose oxidase(GOD) and POD showed Nernstian response to 0.02-1mM glucose at the same condition for hydrogen peroxide and was successfully applied to the determination of glucose in the control serum. 4) We proposed simple numerical model for enzyme Redox-FET electrode and some consideration was undertaken on its response mechanism. (author abst.)

L63 ANSWER 28 OF 40 INSPEC COPYRIGHT 2002 IEE

DUPPLICATE 1

ACCESSION NUMBER: 1991:3858356 INSPEC
DOCUMENT NUMBER: A91055485

TITLE: Electroluminescence at n-SiC/electrolyte interface under cathodic polarization. Observation of EL transients in a short time scale and further evidence for a donor-acceptor transition.

AUTHOR: Manivannan, A. (Dept. of Synthetic Chem., Fac. of Eng., Tokyo Univ., Japan); Itoh, K.; Hashimoto, K.; Sakata, T.; Fujishima, A.

SOURCE: Journal of the Electrochemical Society (Oct. 1990) vol.137, no.10, p.3121-6. 36 refs.

CODEN: JESOAN ISSN: 0013-4651

DOCUMENT TYPE: Journal

TREATMENT CODE: Experimental

COUNTRY: United States

LANGUAGE: English

AB Electroluminescence (EL) at n-SiC/aqueous electrolyte junction was studied under cathodic polarization. Various **redox** electrolytes including current doubling reagents like persulfate were employed to understand the nature of EL. When the cathodic bias is higher than the flatband potential (VFB) of n-SiC **electrode**, species like persulfate are reduced by the conduction band electrons to form highly oxidizing intermediates (SO_4^-) which inject holes into the valence band to produce light (-V>or=VFB). In the case of **redox** electrolytes like $\text{K}_3\text{Fe}(\text{CN})_6$, $\text{Ce}(\text{SO}_4)_2$, etc., the EL emission is weak and occurs at a higher cathodic bias, i.e., when the cathodic bias -V exceeds the bandgap energy of SiC (-V>> E_{bg}). Here, an electron transfer occurs from the valence band to the **redox** electrolyte. This indicates that the minority carrier injection (hole) is an important process in obtaining high EL intensities. The emission appears greenish-yellow and the peak energy of the spectrum is smaller by 1.1 eV than the bandgap of SiC (3.2 eV, calculated from photoresponse measurements), suggesting that the radiative recombination occurs through the impurity luminescent centers. Even under continuous polarization the EL intensity is steady for longer time duration and the **electrodes** are highly stable. The spectral distribution and increase in the EL intensity with different cathodic pulsed **bias potentials** were observed and explained by a donor-acceptor (D-A) mechanism. The charge transfer at the interface and the radiative recombination of electrons and holes inside the **semiconductor** are explained from the characteristics of EL and current intensities vs. time obtained under various pulsed polarized conditions. Moreover, the SiC **electrodes** are highly stable under cathodic steady-state polarization for several hours. Time resolved measurements seem to indicate the EL transients are limited by the current flow.

L63 ANSWER 29 OF 40 INSPEC COPYRIGHT 2002 IEE DUPLICATE 4
ACCESSION NUMBER: 1987:2881602 INSPEC
DOCUMENT NUMBER: A87065363
TITLE: CdTe **semiconductor** electrochemical behavior.
Scope of application as an analytical sensor.
AUTHOR: Elsirafy, A.A.; El-Dessouki, M.S.; El-Basiouny, M.S.
(Fac. of Sci., Cairo Univ., Giza, Egypt)
SOURCE: Journal of the Electrochemical Society (Jan. 1987)
vol.134, no.1, p.221-6. 18 refs.
CODEN: JESOAN ISSN: 0013-4651
DOCUMENT TYPE: Journal
TREATMENT CODE: Practical; Experimental
COUNTRY: United States
LANGUAGE: English
AB In spite of the low **electrode** solar energy conversion efficiency of n-CdTe (approximately=0.1%) in electrochemical solar cells, interesting applicability as an electrochemical sensor is proved for pH and for acid-based as well as **redox** couples titration. The sensitivity of the CdTe **sensor** was found to be dependent upon

the imposed bias voltage with respect to a Pt counterelectrode. Negative biases in the order of -800 mV gave high sensitivity for both potentiometric and amperometric measurements.

L63 ANSWER 30 OF 40 INSPEC COPYRIGHT 2002 IEE DUPLICATE 5
ACCESSION NUMBER: 1984:2298800 INSPEC
DOCUMENT NUMBER: A84088581
TITLE: Semiconductor electrodes. LIV.
Effect of redox couple, doping level, and metal type on the electrochemical and photoelectrochemical behaviour of silicide-coated n-type silicon photoelectrodes.
AUTHOR: Fan, F.F.; Shea, T.V.; Bard, A.J. (Dept. of Chem., Univ. of Texas, Austin, TX, USA)
SOURCE: Journal of the Electrochemical Society (April 1984) vol.131, no.4, p.828-33. 13 refs.
CODEN: JESOAN ISSN: 0013-4651
DOCUMENT TYPE: Journal
TREATMENT CODE: Experimental
COUNTRY: United States
LANGUAGE: English
AB The surface potentials of silicide-coated n-type silicon photoelectrodes as functions of the potential of solution redox couples and the bias potential show that the Fermi level of these photoelectrodes is strongly pinned at the silicide/Si interface. The built-in potential barrier is consistent with the constancy in the photovoltage observed in solutions containing various reversible couples with redox potentials spanning a range larger than the bandgap of silicon. The performance of these photoelectrodes depends strongly on the metal, the charge transfer kinetics at the silicide/solution interface, and the doping density of silicon substrate.

L63 ANSWER 31 OF 40 INSPEC COPYRIGHT 2002 IEE
ACCESSION NUMBER: 2002:7335839 INSPEC
DOCUMENT NUMBER: A2002-17-8780B-039; B2002-09-7230J-002
TITLE: Sensor arrays for fully-electronic DNA detection on CMOS.
AUTHOR: Thewes, R.; Hofmann, F.; Frey, A.; Holzapfl, B.; Schienle, M.; Paulus, C.; Schindler, P. (Corporate Res., Infineon Technol., Munich, Germany); Eckstein, G.; Kassel, C.; Stanzel, M.; Hintsche, R.; Nebling, E.; Albers, J.; Hassman, J.; Schulein, J.; Goemann, W.; Gumbrecht, W.
SOURCE: 2002 IEEE International Solid-State Circuits Conference. Digest of Technical Papers (Cat. No.02CH37315)
Piscataway, NJ, USA: IEEE, 2002. p.350-473 vol.1 of 2 vol.500+600 pp. 2 refs.
Conference: San Francisco, CA, USA, 3-7 Feb 2002
Sponsor(s): IEEE Solid-State Circuits Soc.; IEEE San Francisco Sect.; Bay Area Council; Univ. PA
Price: CCC 0-7803-7335-9/02/\$17.00
ISBN: 0-7803-7335-9
DOCUMENT TYPE: Conference Article
TREATMENT CODE: Practical; Experimental
COUNTRY: United States
LANGUAGE: English
AB Summary form only given. A 16*8 DNA sensor array chip with fully electronic readout is based on an extended CMOS process. Requirements concerning the integration of bio-compatible interface-, sensor- and transducer-materials into a standard-CMOS-environment and circuitry design issues are discussed.

L63 ANSWER 32 OF 40 INSPEC COPYRIGHT 2002 IEE
ACCESSION NUMBER: 1987:2949312 INSPEC
DOCUMENT NUMBER: A87100648; B87056622; C87046686
TITLE: A CMOS potentiostat for amperometric chemical sensors.
AUTHOR: Turner, R.F.B. (Dept. of Electr. Eng., Alberta Univ.,
Edmonton, Alta., Canada); Harrison, D.J.; Baltes, H.P.
SOURCE: IEEE Journal of Solid-State Circuits (June 1987)
vol.SC-22, no.3, p.473-8. 11 refs.
Price: CCCC 0018-9200/87/0600-0473\$01.00
CODEN: IJSCBC ISSN: 0018-9200
DOCUMENT TYPE: Journal
TREATMENT CODE: Application; Practical
COUNTRY: United States
LANGUAGE: English
AB A simple CMOS integrated potentiostatic control circuit is described. The circuit maintains a constant bias potential between the reference and working electrodes. Chemical concentration signals are converted amperometrically to an output voltage with a slope of approximately 60 mV/ mu A. Redox currents from 0.1 to 3.5 mu A can be measured with a maximum nonlinearity of +or-2% over this range. This design also provides the capability of performing differential measurements in order to null the effect of spurious background current. The total power consumption is less than 2 mW. Experimental results are reported showing the performance of the circuit as a chemical sensor control system.

L63 ANSWER 33 OF 40 INSPEC COPYRIGHT 2002 IEE
ACCESSION NUMBER: 1985:2485743 INSPEC
DOCUMENT NUMBER: A85081862
TITLE: Electroluminescence studies of n-GaP (100) and (111) in acetonitrile solutions.
AUTHOR: McIntyre, R.; Smandek, B.; Gerischer, H.
(Fritz-Haber-Inst., Max-Planck-Gesellschaft, Berlin,
West Germany)
SOURCE: Berichte der Bunsengesellschaft fur Physikalische
Chemie (Jan. 1985) vol.89, no.1, p.78-81. 9 refs.
Price: CCCC 0005-9021/85/0101-0078\$02.50/0
CODEN: BBPCAX ISSN: 0005-9021
DOCUMENT TYPE: Journal
TREATMENT CODE: Experimental
COUNTRY: Germany, Federal Republic of
LANGUAGE: English
AB Electroluminescence studies of n-GaP (100) and (111) surfaces have been carried out by hole injection using the cationic components of two selected redox systems, 10-methylphenothiazine (10-MP/10-MP+) and thianthrene (Th/Th+). The luminescence has been studied as a function of electrode potential at cathodic bias. The results are quantitatively in good agreement with expectations based on band edge positions, determined from differential capacitance data. In contrast to the behaviour observed in aqueous solution, stable luminescence has been observed over a wide range of negative potentials. This is believed to be a consequence of avoiding the surface transformation which occurs in connection with the reduction of protons, generating efficient centers for radiationless recombination. The spectral distribution of the emitted light suggests that the luminescence originates from the same sub-band-gap transitions as reported from aqueous studies.

L63 ANSWER 34 OF 40 COMPENDEX COPYRIGHT 2002 EEI
ACCESSION NUMBER: 1995(42):259 COMPENDEX
TITLE: Biosensor design helps diabetics monitor glucose.
AUTHOR: Hanifan, Paul
SOURCE: Design Engineering (London) Jun 1995.p 37-38

CODEN: DEMCBS ISSN: 0308-8448
PUBLICATION YEAR: 1995
DOCUMENT TYPE: Journal
TREATMENT CODE: Application; Experimental
LANGUAGE: English
AB Continued development of MediSense's highly effective method of glucose level self-testing for the world's diabetics has maintained the company a competitive edge and won a Queen's Award for Technological Achievement. MediSense has used an innovative method for diabetics to monitor accurately their own blood sugar levels. The blood glucose monitoring system is now available in two forms: the ExactTech card, and pen sensor with disposable strip. Moreover, the monitor uses the cyclic oxidation/reduction of an enzyme and mediator to generate a current directly proportional to the blood sample's glucose level. The sensor also uses a single enzyme in combination with a stable mediator in glucose measurement.

L63 ANSWER 35 OF 40 COMPENDEX COPYRIGHT 2002 EEI
ACCESSION NUMBER: 1987(8):126775 COMPENDEX
DOCUMENT NUMBER: 870884404
; *87105227
TITLE: CMOS POTENTIOSTAT FOR AMPEROMETRIC CHEMICAL SENSORS.
AUTHOR: Turner, Robin F.B. (Univ of Alberta, Edmonton, Alberta, Can); Harrison, D.Jed; Baltes, Henry P.
SOURCE: IEEE J Solid State Circuits v SC-22 n 3 Jun 1987, Twelfth Eur Solid-State Circuits Conf, Delft, Neth, Sep 16-18 1986 p 473-478
CODEN: IJSCBC ISSN: 0018-9200
PUBLICATION YEAR: 1986
DOCUMENT TYPE: Journal
TREATMENT CODE: Theoretical; Experimental
LANGUAGE: English
AB A simple CMOS integrated potentiostatic control circuit is described. The circuit maintains a constant bias potential between the reference and working electrodes. Chemical concentration signals are converted amperometrically to an output voltage with a slope of approximately 60 mV/ μ A. Redox currents from 0.1 to 3.5 μ A can be measured with a maximum nonlinearity of plus or minus 2% over this range. This design also provides the capability of performing differential measurements in order to null the effect of spurious background current. The total power consumption is less than 2 mW. Experimental results are reported showing the performance of the circuit as a chemical sensor control system. 11 refs.

L63 ANSWER 36 OF 40 COMPENDEX COPYRIGHT 2002 EEI
ACCESSION NUMBER: 1980(12):5912 COMPENDEX
DOCUMENT NUMBER: 801294173
TITLE: ANALYSIS OF CHARGE TRANSFER TO A COPPER PHTHALOCYANINE PHOTOELECTRODE.
AUTHOR: Ayers, W.M.; Graves, D.J.
SOURCE: AIChE Symp Ser n 198 v 76, 1980, Fundam and Appl of Sol Energy, based upon pap presented at AIChE Annu Meet, 72nd, San Francisco, Calif, Nov 25-29 1979. Publ by AIChE, New York, NY, 1980 p 107-116
CODEN: ACSSCQ ISSN: 0065-8812
PUBLICATION YEAR: 1980
LANGUAGE: English
AB The efficiency of photoelectrochemical cells for solar energy conversion is limited by the rate of interfacial electron transfer. Electron transfer to a p-type, semiconducting photoelectrode, copper phthalocyanine, sublimed on a platinum rotating disk electrode, was examined as a function of solution redox potential, bias potential, degree of band bending, and light intensity. A

mathematical model describes carrier photo-generation and transport in the phthalocyanine, and the interfacial reaction rate. Equations for the dark current and photocurrent incorporate the concepts of **redox/semiconductor** energy level matching, band bending, and carrier surface concentration dependence on **bias potential**. 15 refs.

L63 ANSWER 37 OF 40 SCISEARCH COPYRIGHT 2002 ISI (R)
ACCESSION NUMBER: 2001:834106 SCISEARCH
THE GENUINE ARTICLE: 481EJ
TITLE: Potential distribution and photovoltage origin in nanostructured TiO₂ sensitization solar cells: An interference reflection study
AUTHOR: Turrion M; Macht B; Tributsch H; Salvador P (Reprint)
CORPORATE SOURCE: Univ Illes Balears, Dept Matemat & Informat, Cra Valldemossa Km 7-5, E-07071 Palma de Mallorca, Spain (Reprint); Univ Illes Balears, Dept Matemat & Informat, E-07071 Palma de Mallorca, Spain; Hahn Meitner Inst Berlin GmbH, Dept Solare Energet, D-14109 Berlin, Germany
COUNTRY OF AUTHOR: Spain; Germany
SOURCE: JOURNAL OF PHYSICAL CHEMISTRY B, (11 OCT 2001) Vol. 105, No. 40, pp. 9732-9738.
Publisher: AMER CHEMICAL SOC, 1155 16TH ST, NW, WASHINGTON, DC 20036 USA.
ISSN: 1089-5647.
DOCUMENT TYPE: Article; Journal
LANGUAGE: English
REFERENCE COUNT: 26
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS
AB A well-defined modulation reflection spectrum due to a multiple interference process is originated in the TiO₂ dye sensitized solar cell (DSSC). Experimental evidence is shown that the interference process leading to the reflection spectrum takes place at the ii-conducting F:SnO₂(FTO) layer of the FTO/TiO₂ back contact. Moreover, the interference reflectance spectrum is influenced by the applied **potential** and illumination **bias** and disappears when FTO is metallized with 10 Angstrom of platinum. These results show that FTO/TiO₂ cannot be considered as an ohmic but as a rectifying contact where the FTO behaves as a highly doped n-type **semiconductor** which absorbs an important part of the equilibrium contact potential in the dark. On the basis of our experimental results a new insight on the role of the dark equilibrium contact potential at the FFO/TiO₂ interface in the processes of electric charge separation and photovoltage generation is given. Evidence is shown that the theoretically maximum attainable photovoltage in a DSSC is in one direction limited by the equilibrium **redox** potential in the dark, and in the other direction by the (light intensity dependent) bottom of the TiO₂ conduction band.

L63 ANSWER 38 OF 40 SCISEARCH COPYRIGHT 2002 ISI (R)
ACCESSION NUMBER: 1999:826846 SCISEARCH
THE GENUINE ARTICLE: 248TU
TITLE: Redox sensor based on semiconductor film
AUTHOR: Kormos F (Reprint); Pantea C
CORPORATE SOURCE: RALUCA RIPAN CHEM RES INST, KOLOZSVAR, ROMANIA (Reprint)
COUNTRY OF AUTHOR: ROMANIA
SOURCE: MAGYAR KEMIAI FOLYOIRAT, (SEP 1999) Vol. 105, No. 9, pp. 379-381.
Publisher: MAGYAR KEMIA FOLYOIRAT, SZERKESZTOSÉGE GELLERT TER 4, 1111 BUDAPEST, HUNGARY.
ISSN: 0025-0155.
DOCUMENT TYPE: Article; Journal
FILE SEGMENT: PHYS

LANGUAGE: Hungarian

REFERENCE COUNT: 9

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB A **redox sensor** based on SnO₂ film doped with Sb³⁺ is presented. The **redox** sensitivity, chemical stability, the useful potential range and the impedance of the electrochemical cell consisting of the **redox sensor** and the SCE **electrode**, were also studied. The experimental results show that the **redox sensor** based on SnO₂ film may replace the classical noble metal **electrodes** in many amperometric and potentiometric determinations.

L63 ANSWER 39 OF 40 SCISEARCH COPYRIGHT 2002 ISI (R)

ACCESSION NUMBER: 1999:307991 SCISEARCH

THE GENUINE ARTICLE: 186KY

TITLE: The improved potentiometric pH response of **electrodes** modified with processible polyaniline.

AUTHOR: Application to glucose biosensor
Karyakin A A (Reprint); Lukachova L V; Karyakina E E;
Orlov A V; Karpachova G P

CORPORATE SOURCE: MOSCOW MV LOMONOSOV STATE UNIV, FAC CHEM, MOSCOW 119899,
RUSSIA (Reprint); RUSSIAN ACAD SCI, AV TOPCHIEV PETROCHEM
SYNTH INST, MOSCOW 117912, RUSSIA

COUNTRY OF AUTHOR: RUSSIA

SOURCE: ANALYTICAL COMMUNICATIONS, (APR 1999) Vol. 36, No. 4, pp.
153-156.

Publisher: ROYAL SOC CHEMISTRY, THOMAS GRAHAM HOUSE,
SCIENCE PARK, MILTON ROAD, CAMBRIDGE CB4 0WF, CAMBS,
ENGLAND.

ISSN: 1359-7337.

DOCUMENT TYPE: Article; Journal

FILE SEGMENT: PHYS

LANGUAGE: English

REFERENCE COUNT: 24

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB Processible polyaniline (PCPAn) modified **electrodes** are characterized by an advanced potentiometric pH response in comparison to those based on regular polyaniline. Glassy carbon **electrodes** modified with PCPAn by dip-coating exhibited a fully reversible potentiometric response of approximately 90 mV pH(-1) over the range pH 3-9. Such significantly higher potentiometric responses of PCPAn modified **electrodes** compared to existing devices is explained on the basis of the thermodynamics of polyaniline **redox** reactions. The potentiometric **biosensor** for glucose based on processible polyaniline has been developed using a non-aqueous enzymology approach for enzyme immobilization. In the model solution, which mimics blood serum, the biosensor was useful for glucose detection over the concentration range 0.1-30 mM and the maximum response value reached was approximate to 80 mV. The advanced potentiometric response of PCPAn modified **electrodes** provides their application for sensor and biosensor development.

L63 ANSWER 40 OF 40 SCISEARCH COPYRIGHT 2002 ISI (R)

ACCESSION NUMBER: 97:69674 SCISEARCH

THE GENUINE ARTICLE: BG91X

TITLE: Nanostructures in analytical chemistry

AUTHOR: Pelizzetti E (Reprint); Minero C

CORPORATE SOURCE: UNIV TURIN, DEPT ANALYT CHEM, VIA P GIURINA 5, I-10125
TURIN, ITALY (Reprint)

COUNTRY OF AUTHOR: ITALY

SOURCE: SEMICONDUCTOR NANOCLUSTERS- PHYSICAL, CHEMICAL, AND
CATALYTIC ASPECTS, (DEC 1997) Vol. 103, pp. 377-390.
Publisher: ELSEVIER SCIENCE PUBL B V, SARA

BURGERHARTSTRAAT 25, PO BOX 211, 1000 AE AMSTERDAM,
NETHERLANDS.

DOCUMENT TYPE: Article; Journal
FILE SEGMENT: PHYS
LANGUAGE: English
REFERENCE COUNT: 42

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB The use of nanoscale **semiconductors** has interesting potential applications in analytical chemistry. Opportunities for building up **sensor** systems, ultramicroelectrodes, separation based on adsorption or filtration, immunoassay, selective **redox** processes, and total organic carbon devices are briefly discussed.

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